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(21) International Application Number: PCT/US98/25475 (22) International Filing Date: 1 December 1998 (01.12.98) (30) Priority Data: 08/986,065 5 December 1997 (05.12.97) US (71) Applicant: NANOGEN, INC. [US/US]; 10398 Pacific Center Court, San Diego, CA 92121 (US). (72) Inventors: SOSNOWSKI, Ronald, G.; 1013 Adella Avenue, Coronado, CA 92118 (US). BUTLER, William, F.; 7577 Caloma Circle, Carlsbad, CA 92009 (US). TU, Eugene; 3527 Lark Street, San Diego, CA 92103 (US). NERENBERG, Michael, I.; 11256 Caminito Inocenta, San Diego, CA 92014 (US). HELLER, Michael, J.; 1614 Hawk View Drive, Encinitas, CA 92024 (US). EDMAN, Carl, F.; 12545-C El Camino Real, San Diego, CA 92130 (US). (74) Agents: MURPHY, David, B. et al.; Lyon & Lyon, LLP, Suite 4700, 633 West Fifth Street, Los Angeles, CA 90071-2066 (US).		(81) Designated States: AU, BR, CA, CN, JP, KR, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>
(54) Title: SELF-ADDRESSABLE SELF-ASSEMBLING MICROELECTRONIC INTEGRATED SYSTEMS, COMPONENT DEVICES, MECHANISMS, METHODS, AND PROCEDURES FOR MOLECULAR BIOLOGICAL ANALYSIS AND DIAGNOSTICS (57) Abstract A self-addressable, self-assembling microelectronic device is designed and fabricated to actively carry out and control multi-step and multiplex molecular biological reactions in microscopic formats. These reactions include nucleic acid hybridizations, antibody/antigen reactions, diagnostics, and biopolymer synthesis. The device can be fabricated using both micro-lithographic and micro-machining techniques. The device can electronically control the transport and attachment of specific binding entities to specific micro-locations. The specific binding entities include molecular biological molecules such as nucleic acids and polypeptides. The device can subsequently control the transport and reaction of analytes or reactants at the addressed specific micro-locations. The device is able to concentrate analytes and reactants, remove non-specifically bound molecules, provide stringency control for DNA hybridization reactions, and improve the detection of analytes. The device can be electronically replicated.		